Vehicle Mounted Milk Meter Tolerances

Current Tolerances

Vehicle-Mounted Milk Meters

Table 2.
Tolerances for Vehicle-Mounted Milk Meters

Indication (gallons)	Maintenance Tolerance (gallons)	Acceptance Tolerance (gallons)
100	0.5	0.3
200	0.7	0.4
300	0.9	0.5
400	1.1	0.6
500	1.3	0.7
Over 500	Add 0.002 gallon per indicated gallon over 500	Add 0.001 gallon per indicated gallon over 500

(Added 1989)

Current Tolerances

Vehicle Tank Meters

Table 1.
Accuracy Classes and Tolerances for Vehicle-Tank Meters Other Than Vehicle-Mounted Milk Meters

Accuracy Class	Application		Acceptance Tolerance	Maintenance Tolerance	Special Test Tolerance
0.3	- Petroleum products delivered from large capacity (flow rates over 115 L/min or 30 gpm)** devices, including motor-fuel devices - Heated products (other than asphalt) at temperatures greater than 50 °C (122 °F) - Asphalt at temperatures equal to or below 50 °C (122 °F) - All other liquids not shown in the table where the typical delivery is greater than 200 L (50 gal)		0.15 %	0.3 %	0.45 %
0.3A	- Asphalt at temperatures greater than 50 °C (122 °F)		0.3 %	0.3 %	0.5 %
0.5*	- Petroleum products delivered from small capacity (at 4 L/min (1 gpm) through 115 L/min or 30 gpm)** motor-fuel devices - Agri-chemical liquids - All other applications not shown in the table where the typical delivery is ≤ 200 L (50 gal)		0.3 %	0.5 %	0.5 %
1.1	- Petroleum products and other normal liquids from devices with flow rates** less than 4 L/min (1 gpm) and - Devices designed to deliver less than 4 L (1 gal)		0.75 %	1.0 %	1.25 %
1.5	- Water	Overregistration	1.5 %	1.5 %	1.5 %
		Underregistration	1.5 %	1.5 %	5.0 %

* For 5 gal and 10 gal test drafts, the tolerances specified for Accuracy Class 0.5 in the table above do not apply. For these test drafts, the maintenance tolerances on normal and special tests for 5 gal and 10 gal test drafts are 6 in^3 and 11 in^3, respectively. Acceptance tolerances on normal and special tests are 3 in^3 and 5.5 in^3.

** Flow rate refers to designed or marked maximum flow rate.

(Added 2002) (Amended 2013)

Current Tolerances

Milk Meters

Table 1. Tolerances for Milk Meters		
Indication	**Maintenance**	**Acceptance**
gallons	**gallons**	**gallons**
100	0.5	0.3
200	0.7	0.4
300	0.9	0.5
400	1.1	0.6
500	1.3	0.7
Over 500	Add 0.002 gallon per indicated gallon over 500	Add 0.001 gallon per indicated gallon over 500

(Added 1989)

Current Tolerances

Farm Milk Tanks

T. Tolerances

T.1. Application. – The tolerances hereinafter prescribed shall be applied equally to errors in excess and errors in deficiency.

T.2. Minimum Tolerance Values. – On a particular tank, the maintenance and acceptance tolerance applied shall be not smaller than the volume corresponding to the graduated interval at the point of test draft on the indicating means or 2 L (½ gal), whichever is greater.

(Amended 1980)

T.3. Basic Tolerance Values. – The basic maintenance and acceptance tolerance shall be 0.2 % of the volume of test liquid in the tank at each test draft.

(Amended 1975)

T.4. Basic Tolerance Values, Master Meter Method. – The basic maintenance and acceptance tolerance for tanks tested by the master meter method shall be 0.4 % of the volume of test liquid in the tank at each test draft.

(Added 1975)

Current Tolerances

Mass Flow Meters

Table T.2.
Accuracy Classes and Tolerances for Mass Flow Meters

Accuracy Class	Application or Commodity Being Measured	Acceptance Tolerance	Maintenance Tolerance	Special Tolerance
0.3	- Large capacity motor-fuel dispensers (maximum discharge flow rates greater than 100 L/min or 25 gal/min) - Heated products (other than asphalt) at temperatures greater than 50 °C (122 °F) - Asphalt at temperatures equal to or below 50 °C (122 °F) - Loading rack meters - Vehicle-tank meters - Home heating oil - Milk and other food products - All other liquid applications not shown in the table where the minimum delivery is at least 700 kg (1500 lb)	0.2 %	0.3 %	0.5 %
0.3A	- Asphalt at temperatures greater than 50 °C (122 °F)	0.3 %	0.3 %	0.5 %
0.5	- Small capacity (retail) motor-fuel dispensers - Agri-chemical liquids - All other liquid applications not shown in the table where the minimum delivery is less than 700 kg or 1500 lb	0.3 %	0.5 %	0.5 %
1.0	- Anhydrous ammonia - LP Gas (including vehicle-tank meters)	0.6 %	1.0 %	1.0 %
2.0	- Compressed natural gas as a motor-fuel	1.5 %	2.0 %	2.0 %
2.5	- Cryogenic liquid meters - Liquefied compressed gases other than LP Gas	1.5 %	2.5 %	2.5 %

(Added 1994) (Amended 1999, 2001, and 2013)

Current Tolerances

Current Tolerances MAINTENANCE									
Indication Gallons	Tolerance (GAL)	Tolerance (%)	Change in Tolerance from previous tolerance point (%)	Change in Tolerance from previous tolerance point (GAL)	Tolerance allowed if previous level at limits (GAL)	Tolerance allowed if previous level at limit (%)	Potential cumulative tolerance lost due to decreasing tolerances (GAL)	Remaining Tolerance left due to decreasing tolerances (GAL)	Remaining Tolerance left due to decreasing tolerances (%)
		(B)/(A)	**(Previous-Current) (C)**	**(D)*(A)**	**(B)-(E)**	**(F)/(A)**	**(E) Current + (H) Previous**	**(B)-(H)**	**(I)/(A)**
100	0.5	0.500%	0%	0	0.5	0.50%	0	0.5	0.50%
200	0.7	0.350%	0.1500%	0.3	0.4	0.20%	0.3	0.4	0.20%
300	0.9	0.300%	0.0500%	0.15	0.75	0.25%	0.45	0.45	0.15%
400	1.1	0.275%	0.0250%	0.1	1	0.25%	0.55	0.55	0.14%
500	1.3	0.260%	0.0150%	0.075	1.225	0.25%	0.6250	0.6750	0.14%
600	1.5	0.250%	0.0100%	0.06	1.44	0.24%	0.6850	0.8150	0.14%
700	1.7	0.243%	0.0071%	0.05	1.65	0.24%	0.7350	0.9650	0.14%
800	1.9	0.238%	0.0054%	0.0429	1.8571	0.23%	0.7779	1.1221	0.14%
900	2.1	0.233%	0.0042%	0.0375	2.0625	0.23%	0.8154	1.2846	0.14%
1000	2.3	0.230%	0.0033%	0.03333	2.2667	0.23%	0.8487	1.4513	0.15%

Current Tolerances

Current Tolerances ACCEPTANCE									
Indication Gallons	Tolerance (GAL)	Tolerance (%)	Change in Tolerance from previous tolerance point (%)	Change in Tolerance from previous tolerance point (GAL)	Tolerance allowed if previous level at limits (GAL)	Tolerance allowed if previous level at limit (%)	Potential cumulative tolerance lost due to decreasing tolerances (GAL)	Remaining Tolerance left due to decreasing tolerances (GAL)	Remaining Tolerance left due to decreasing tolerances (%)
		(B)/(A)	**(Previous-Current) (C)**	**(D)*(A)**	**(B)-(E)**	**(F)/(A)**	**(E) Current + (H) Previous**	**(B)-(H)**	**(I)/(A)**
100	0.3	0.300%	0%	0	0.3	0.30%	0	0.3	0.30%
200	0.4	0.200%	0.1000%	0.2	0.2	0.10%	0.2	0.2	0.10%
300	0.5	0.167%	0.0333%	0.1	0.4	0.13%	0.3	0.2	0.07%
400	0.6	0.150%	0.0167%	0.0667	0.5333	0.13%	0.3667	0.2333	0.06%
500	0.7	0.140%	0.0100%	0.0500	0.6500	0.13%	0.4167	0.2833	0.06%
600	0.8	0.133%	0.0067%	0.0400	0.7600	0.13%	0.4567	0.3433	0.06%
700	0.9	0.129%	0.0048%	0.0333	0.8667	0.12%	0.4900	0.4100	0.06%
800	1	0.125%	0.0036%	0.0286	0.9714	0.12%	0.5186	0.4814	0.06%
900	1.1	0.122%	0.0028%	0.0250	1.0750	0.12%	0.5436	0.5564	0.06%
1000	1.2	0.120%	0.0022%	0.0222	1.1778	0.12%	0.5658	0.6342	0.06%

Tolerance History

Removed from VTM Code in 2002

Table 1.
Tolerances for Vehicle-Tank Meters Except for Vehicle-Mounted Milk Meters, Agri-Chemical Meters, and Water Meters

	Normal tests		Special tests
Indication	Maintenance tolerance	Acceptance tolerance	Maintenance and acceptance tolerance
(Gallons)	(Cubic inches)	(Cubic inches)	(Cubic inches)
50	50	25	50
Over 50	Add 1/2 cubic inch per indicated gallon over 50	Add 1/4 cubic inch per indicated gallon over 50	Add 1 cubic inch per indicated gallon over 50

Tolerance History

Added to VTM Code in 1989

Table 2a.
TOLERANCES FOR MASS FLOW METERS MEASURING MILK

Indication (Pounds)	Maintenance tolerance (Pounds)	Acceptance tolerance (Pounds)
1,000	5	3
2,000	7	4
3,000	9	5
4,000	11	6
5,000	13	7
Over 5,000	Add 0.002 pound per indicated pound over 5,000	Add 0.001 pound per indicated pound over 5,000

Tolerance History

Farm Milk Tank Tolerance in 1954

TABLE 1.—*Maintenance and acceptance tolerances for farm milk tanks*

Indicated gallonage	Tolerance
	Gallons
500 or less	½
501 to 1,000, incl	1
1,001 to 1,500, incl	1½
1,501 to 2,000, incl	2
Over 2,000	2½

OIML Tolerances

- Line A - Complete Measuring Systems
- Line B - Meter

Table 2

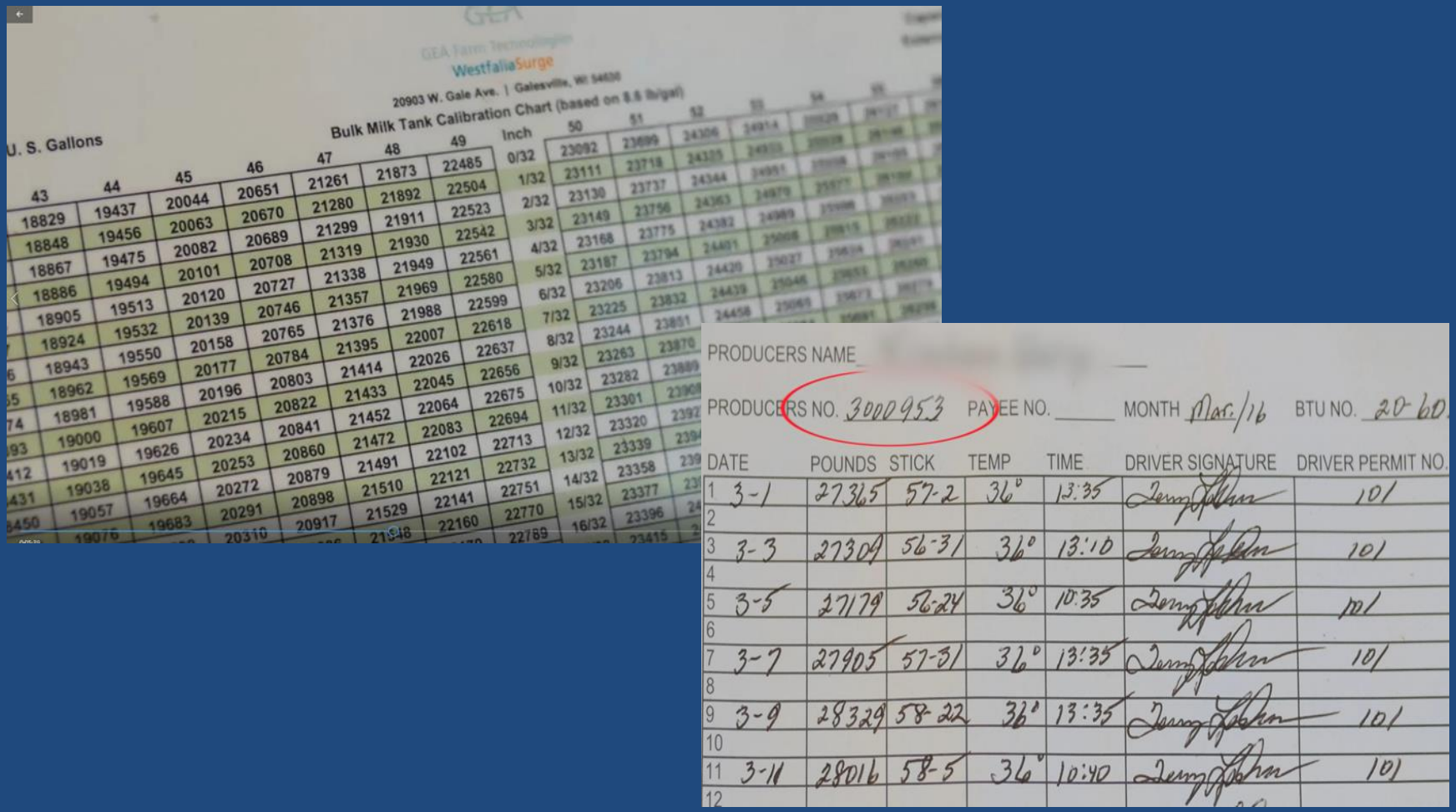
	Accuracy class			
Line	0.3	0.5	1.0	1.5
A (*)	0.3 %	0.5 %	1.0 %	1.5 %
B (*)	0.2 %	0.3 %	0.6 %	1.0 %
C (equal to Line A – Line B)	0.1 %	0.2 %	0.4 %	0.5 %

(*) see 2.6 for application of line A or line B.

Milk Production in Kansas

Milk Production in Kansas

Milk Production in Kansas



GEA Farm Technologies
WestfaliaSurge
20903 W. Gale Ave. | Galesville, WI 54630

Bulk Milk Tank Calibration Chart (based on 8.6 lb/gal)

U. S. Gallons	43	44	45	46	47	48	49	50	51	52	53	54	55
Inch													
0/32	18829	19437	20044	20651	21261	21873	22485	23092	23699	24306	24914	[illegible]	[illegible]
1/32	18848	19456	20063	20670	21280	21892	22504	23111	23718	24325	24933	[illegible]	[illegible]
2/32	18867	19475	20082	20689	21299	21911	22523	23130	23737	24344	24951	[illegible]	[illegible]
3/32	18886	19494	20101	20708	21319	21930	22542	23149	23756	24363	24979	[illegible]	[illegible]
4/32	18905	19513	20120	20727	21338	21949	22561	23168	23775	24382	24989	[illegible]	[illegible]
5/32	18924	19532	20139	20746	21357	21969	22580	23187	23794	24401	25008	[illegible]	[illegible]
6/32	18943	19550	20158	20765	21376	21988	22599	23206	23813	24420	25027	[illegible]	[illegible]
7/32	18962	19569	20177	20784	21395	22007	22618	23225	23832	24439	25046	[illegible]	[illegible]
8/32	18981	19588	20196	20803	21414	22026	22637	23244	23851	24458	25069	[illegible]	[illegible]
9/32	19000	19607	20215	20822	21433	22045	22656	23263	23870	[illegible]	[illegible]	[illegible]	[illegible]
10/32	19019	19626	20234	20841	21452	22064	22675	23282	23889	[illegible]	[illegible]	[illegible]	[illegible]
11/32	19038	19645	20253	20860	21472	22083	22694	23301	23909	[illegible]	[illegible]	[illegible]	[illegible]
12/32	19057	19664	20272	20879	21491	22102	22713	23320	23927	[illegible]	[illegible]	[illegible]	[illegible]
13/32	19076	19683	20291	20898	21510	22121	22732	23339	23946	[illegible]	[illegible]	[illegible]	[illegible]
14/32	[illegible]	[illegible]	20310	20917	21529	22141	22751	23358	23965	[illegible]	[illegible]	[illegible]	[illegible]
15/32	[illegible]	[illegible]	[illegible]	[illegible]	21548	22160	22770	23377	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16/32	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22789	23396	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	23415	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PRODUCERS NAME [illegible]

PRODUCERS NO. 3000953 PAYEE NO. _____ MONTH Mar./16 BTU NO. 20-60

	DATE	POUNDS	STICK	TEMP	TIME	DRIVER SIGNATURE	DRIVER PERMIT NO.
1	3-1	27365	57-2	36°	13:35	[illegible]	101
2							
3	3-3	27304	56-31	36°	13:10	[illegible]	101
4							
5	3-5	27179	56-24	36°	10:35	[illegible]	101
6							
7	3-7	27905	57-31	36°	13:35	[illegible]	101
8							
9	3-9	28329	58-22	36°	13:35	[illegible]	101
10							
11	3-11	28016	58-5	36°	10:40	[illegible]	101
12							

Milk Production in Kansas

Potential errors due to:

- Incorrectly calibrated tanks
- Conversion chart errors
- Out of level tanks
- Shifted tanks
- Improper footings
- Wear or distortion of measuring stick or stick seat
- Human error